

## **REMARKS/ARGUMENTS**

Claims 1 – 9 are presented for reconsideration and further examination in view of the foregoing amendments and following remarks. Claims 10 and 11 are newly presented for first action on the merits.

In the outstanding Office Action, the Examiner rejected claims 1 – 9 under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement.

The Examiner also rejected claims 2 – 4 under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. More specifically, the Examiner indicated that recitation of "said thermoplastic polymer material" lacks sufficient antecedent basis.

Further, the Examiner rejected claims 1 and 5 – 9 under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 4,129,946 to Kennedy (hereinafter referred to as "Kennedy"), and rejected claims 2 – 4 under 35 U.S.C. 103(a) as being unpatentable over Kennedy in view of U.S. Patent No. 6,186,790 to Karmaker et al (hereinafter referred to as "Karmaker").

By this response, claims 1, 2, and 4 are amended, and, as amended, the above rejections to these claims and all claims dependent thereon are traversed.

It is respectfully submitted that no new matter has been added to this application by the foregoing amendments within the meaning of 35 U.S.C. §132.

### **Claim Rejection Under 35 U.S.C. 112, First Paragraph**

The Examiner rejected claims 1 – 9 under 35 U.S.C. 112, first paragraph, for containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had

possession of the claimed invention.

In particular, the Examiner states that the feature of “at least one of said depending flexible continuous side surfaces having an inner surface shaped with an undercut” was not described in the original specification. However, the Examiner states that the “specification describes at least one of the side surfaces defining an undercut...”

Also, the Examiner states that the feature of “said dental crown is formed of a resilient and dimensionally stable thermoplastic material” was not described in the original specification. The Examiner contrasts this feature with that of a “dimensionally stable thermoplastic material used to form the crown.”

### **Response**

Applicant submits that the above amendments obviate the Examiner’s causes for rejection under 35 U.S.C. 112, first paragraph.

In particular, claim 1 has been amended to positively recite “one of said depending continuous side surfaces formed with an undercut defining an inwardly directed bottom portion,” and “said dental crown being formed of a thermoplastic material enabling dimensional stability and sufficient resilience of the crown...” It is respectfully submitted that these amendments remove the Examiner’s causes for rejection.

Applicant notes that these amendments are made without prejudice or disclaimer, and without assenting to the Examiner’s characterization of the claims or the Examiner’s rejections thereof. Applicant reserves the right to pursue the unamended language of these claims, and the full scope thereof, in continuing application, and through enforcement of the full scope of the pending claims.

Similar language is provided in new claims 10 and 11, in consideration of the Examiner's grounds for rejection of claim 1.

Reconsideration and withdrawal of all rejections under 35 U.S.C. 112, first paragraph, are requested.

### **Claim Rejection Under 35 U.S.C. 112, Second Paragraph**

The Examiner rejected claims 2 – 4 under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. More specifically, the Examiner indicated that recitation of "said thermoplastic polymer material" lacks sufficient antecedent basis.

### **Response**

Applicant submits that the above amendments obviate the Examiner's causes for rejection under 35 U.S.C. 112, second paragraph.

In particular, claim 1 now positively recites "a thermoplastic material," while claims 2 and 4, which depend from claim 1, recite "said thermoplastic material."

Reconsideration and withdrawal of all rejections under 35 U.S.C. 112, second paragraph, are requested.

### **Claim Rejection Under 35 U.S.C. 102(b)**

The Examiner rejected claims 1 and 5 – 9 under 35 U.S.C. 102(b) as being anticipated by Kennedy.

### Response

Independent claim 1 has been amended and, as amended, the rejections thereto are traversed since all of the features of amended independent claim 1 are not present in the cited prior art.

For a reference to anticipate an invention, all of the elements of that invention must be present in the reference. The test for anticipation under section 102 is whether each and every element as set forth in the claim is found, either expressly or inherently, in a single prior art reference. *Verdegaal Bros. v. Union Oil Co. of California*, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987); MPEP §2131.

Claim 1 has been amended, and positively recites a “dental crown configured to be readily mountable in a patient’s mouth as part of a treatment of primary teeth and permanent molars, the dental crown having a natural appearance and color of a vital tooth...” The crown comprises “a tooth shaped top surface” and “depending flexible side surfaces...” The dental crown is “formed of a thermoplastic material enabling dimensional stability and sufficient resilience of the crown...” Also, at least one of the depending flexible side surfaces is “formed with an undercut defining an inwardly directed bottom portion, thereby enabling the dental crown to be mounted on a primary tooth or permanent molar.”

The inventive subject matter relates to a dental crown which is configured for treatment of primary teeth and permanent molars and which is made of a thermoplastic polymer material. In the present inventive subject matter, mechanical retention of the crowns (made of e.g. homopolymer acetal resin) is based on bulges on buccal and lingual sides of teeth. A tooth to be restored using a composite material goes through clinical processes well known to general dentists: first, the outer enamel surface has to be prepared using a strong acid (a procedure known by the name of etching); the strong acid dissolves the enamel and creates micro-retentions on the surface; then, into those

micro-retention grooves the composite enters and remains attached to the tooth surface after curing.

It is respectfully submitted that the features of claim 1 are not found in Kennedy.

Applicant submits that Kennedy does not disclose, teach, or suggest a “dental crown configured to be readily mountable in a patient’s mouth as part of a treatment of primary teeth and permanent molars, the dental crown having a natural appearance and color of a vital tooth...” In contradistinction, Kennedy describes *an improvement to existing crown forms*. It should be understood and also is specifically described in Kennedy that *crown forms are used for holding and shaping a body of composite material*. The latter is then applied to an anterior tooth requiring restoration (see for example the abstract of Kennedy). Thus, the technique of Kennedy relates to manufacture and use of an accessory element (again, a *crown form*, or as it is termed in Kennedy, a “*strip crown*”), which is merely an intermediate element in the procedure of dental crown creation, and not the final readily mountable crown as that presently claimed. More specifically, according to Kennedy, the crown form is a transparent, thin shell (0.010±0.0003 Inch- see Kennedy, page 2, line 59) *that is removed from the restoration after curing of the composite material* (see Kennedy, page 4, line 6-8). Kennedy in fact intends for this *composite material* to remain on the tooth and restore it, and not the crown form.

In other words, Kennedy is drawn only to modifications which may be made to composite materials (see page 1 line 6), but not to forms or structures of composite material *per se*. These improvements, as described above, relate only to a *crown form*, used for holding shaping a future crown, and not to a crown itself, i.e. a crown readily mountable onto a tooth.

It should be understood that the retention of the composite material on the tooth is different from the mechanical retention of the crowns (made of e.g. homopolymer acetal resin) of the present inventive subject matter. The crown form of Kennedy is aimed at a purpose different from that of a

dental crown of the present subject matter, and has a different configuration. As non-limiting examples, the crown form of Kennedy is configured for holding and shaping composites applied to anterior primary and permanent teeth with carious attack or fractures. The crown form is not a part of the final restoration. The same restoration can be performed even without the crown form; the form helps in shaping the restorative material. In contradistinction, according to the present application, the dental crown is configured as readily mountable on a tooth (see par. 0022), and is thus a final restoration (that is, the tooth cannot be restored with merely a crown form as in Kennedy, but requires a crown as presently claimed).

The structure above is recited in Claim 1, and thus present in all claims dependent therefrom, and is not found in Kennedy. In addition, according to the present claims, in order to enable the crown to be being readily mountable on the tooth, the crown has an “undercut defining an inwardly directed bottom portion” of at least one side surface thereof. This feature too is not disclosed in Kennedy; on the contrary all the illustrations in Kennedy show substantially parallel side surfaces (Kennedy element 13) at the bottom portion of the crown form.

Thus, as Kennedy fails to disclose, teach, or suggest all the feature of independent claim 1, and thus of claims 5 – 9 dependent therefrom, Applicant submits that Kennedy does not anticipate these claims. Reconsideration and withdrawal of all outstanding rejections are requested.

### **Claim Rejection Under 35 U.S.C. 103(a)**

The Examiner rejected claims 2 – 4 under 35 U.S.C. 103(a) as being unpatentable over Kennedy in view of Karmaker.

### Response

To establish a *prima facie* case of obviousness, the Examiner must establish that the prior art references teach or suggest all of the claim limitations. *Amgen, Inc. v. Chugai Pharm. Co.*, 18 USPQ2d 1016, 1023 (Fed. Cir. 1991); *In re Fine*, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988); *In re Wilson*, 165 USPQ 494, 496 (CCPA 1970).

Claims 2 – 4 depend from Claim 1, and as noted above, Kennedy does not disclose, teach, or suggests all the features of Claim 1, let alone claims 2 – 4.

The Examiner cites Karmaker to recite a thermoplastic polymer material, which the Examiner admits is absent from the disclosure of Kennedy.

However, Karmaker does not cure the deficiencies of Kennedy with respect to amended claim 1, since Karmaker too does not disclose, teach, or suggest a “dental crown configured to be readily mountable in a patient’s mouth as part of a treatment of primary teeth and permanent molars” whatsoever, let alone a dental crown “formed of a thermoplastic material enabling dimensional stability and sufficient resilience of the crown” or a dental crown “formed with an undercut defining an inwardly directed bottom portion, thereby enabling the dental crown to be mounted on a primary tooth or permanent molar.” Karmaker merely discloses “prefabricated cured structural components *to be used in the fabrication of dental appliances.*” (Karmaker, Abstract, emphasis added)

Therefore, the cited prior art references, taken alone or in combination with each other, do not disclose, teach or suggest the features of independent claim 1. As such, independent claim 1 is asserted to be patentable over the cited prior art references. Similarly, as dependent claims necessarily contain all of the features of the independent claim from which they depend, claims 2 – 4 are asserted to be patentable over the cited prior art for at least the reason that they depend from claim 1. Accordingly, Applicant respectfully requests that the Examiner reconsider and withdraw all

rejections under 35 U.S.C. 102(b) and 35 U.S.C. 103(a).

### NEW CLAIMS

With the present amendments, Applicant submits new independent claims 10 and 11.

New claim 10 recites a “dental crown configured to be mounted in a patient's mouth...” The dental crown is “made of acetal homopolymer resin and having a natural appearance and color of a vital tooth...” The crown has “a tooth shaped top surface and depending flexible side surfaces extending,” *inter alia*, “continuously around edges of said tooth shaped top surface...” The dental crown is “dimensionally stable” and has “sufficient resilience.” At least one of the side surfaces is “formed with an undercut defining an inwardly directed bottom portion, thereby enabling the dental crown to be readily mountable on a primary tooth or permanent molar.”

Support for new claim 10 may be found in the specification and claims as originally filed, including *inter alia* in the first paragraph of page 2 of the specification as originally filed, and the last paragraph of page 3 of the specification as originally filed.

Applicant respectfully submits that the above features are not found in the cited art of record, and as such, that new claim 10 is allowable.

New claim 11 recites a “method for manufacturing a dental crown...” The method includes *inter alia* the step of “providing a mold cavity defined by a top mold element, a bottom mold element and an ejector...” The method also includes the steps of “injecting acetal homopolymer resin material into the mold cavity through said cut channel thereby forming a molded dental crown in said cavity,” and “separating the bottom mold element from the top mold element allowing removal of the molded crown from said cavity.” The “top mold element” has a “cut channel.”

Support for new claim 11 may be found in the specification and claims as originally filed,



including *inter alia* page 3 in its entirety of the specification as originally filed.

Applicant respectfully submits that the above features are not found in the cited art of record, and as such, that new claim 11 is allowable.

### CONCLUSION

In light of the foregoing, Applicant submits that the application is now in condition for allowance. If the Examiner believes the application is not in condition for allowance, Applicant respectfully requests that the Examiner contact the undersigned attorney if it is believed that such contact will expedite the prosecution of the application.

In the event this paper is not timely filed, Applicant petitions for an appropriate extension of time. Please charge any fee deficiency or credit any overpayment to Deposit Account No. 14-0112.

Respectfully submitted,  
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